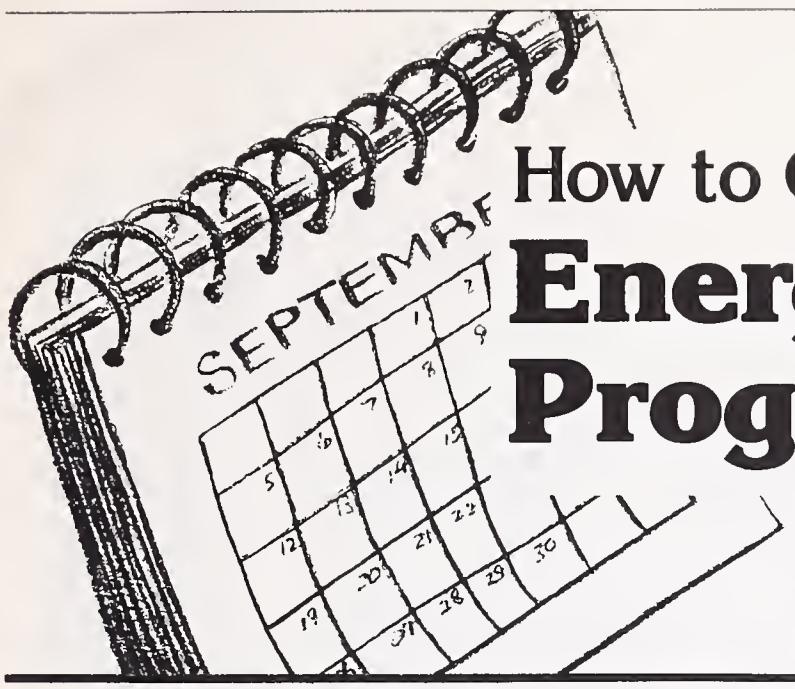
ENERGY MANAGEMENT IN SCHOOLS



How to Organize Your Energy Management Program

One of a series of booklets prepared by the Massachusetts Office of Energy Resources

Why Energy Management?

Dramatic Past Increases in Energy Costs

As you know from your own fuel and electric bills, the cost of energy has increased dramatically since 1972. For example, the price of a gallon of heating oil in most areas has gone from about 20¢ before the 1973 oil crisis to well over 70¢ in 1979, and a kilowatt hour of electricity that used to be 2½¢ is now 6¢ or more. If you were to check your bills, you'd probably find your own costs had gone up 200% or more.

Continued Cost Increases Make Conservation Necessary

The cost of energy is rising faster than most other costs today. People responsible for buildings are likely to continue to face spiraling hikes in the price of oil and perhaps other forms of energy as well.

As the unit costs of certain kinds of energy continue to rise, it becomes increasingly clear that the only way you can do something about your energy bills is to consume less. For while there's little if anything you can do to stabilize or reduce the price of a single gallon of heating oil, for example, it *is* possible to reduce the number of gallons you use. So, by using less of this expensive form of energy, you can partially or fully offset future increases in unit energy prices. This way you should be able to come up with net savings that are significant for your budget, allowing you to devote more of your financial resources to pay for delayed improvements, salary increases, or other necessary expenses. And you can do this without sacrificing comfort.

Control Through an Energy Management Program

You can control your use of energy through an Energy Management Program. Your *goal* is to use only the energy that's really needed, use it efficiently, and prevent your energy bills from skyrocketing.

This booklet will help you to organize an energy management program that will effectively achieve this goal. A good part of cutting costs and reducing energy waste can be done quickly and at little or no cost to you. However, the "know-how" to do this will be necessary, and it will take some effort on your part to achieve the potential savings. What you need to do is included in the energy management program described here; by following this "road map" of energy management, you will get significant results, usually without major changes in the existing routines and conditions in your building.

School System Saves $380,000 over 5 Years

A recent report of the Weston School Committee cites a 40% decrease in the use of heating oil and a 30% reduction in the consumption of electricity for the school system in this town of 12,000 people. Estimated savings (cost avoidance) of $380,000 were calculated for the period of the past 5 years, as the result of a variety of no-cost measures and capital improvements.

Feel Free To Ask for Help

If you have any questions about the subjects covered in this booklet or if you need help in carrying out any phase of your energy management program, feel free to contact the staff at:

Massachusetts Office of Energy Resources
73 Tremont Street, Room 800
Boston, Massachusetts 02108
(617) 727-1990

You Can Reduce Energy Use by 30% or More

The amount you can save on your fuel and electric bills depends on many things: the design of your building, how heavily it's used, whether you're already conserving effectively, alternate fuels available, the amount of capital you can

Commonwealth of Massachusetts
Edward J. King, Governor

Office of Energy Resources
Joseph S. Fitzpatrick, Director

invest, etc. But it's generally reasonable for you to expect to be able to reduce overall energy consumption by at least 30% and often more. Perhaps half of this can be saved using low-cost or no-cost ways to change how you operate and maintain your energy systems, while the rest of the savings will require some capital investment to modify your systems or your building.

A Program That Will Get Results

An 11-Point Program for Results

No two energy management programs are exactly alike. You'll want to make sure your program is tailored to meet your particular needs, but there are certain basics which you'll want to include. Following these basic 11 points will guarantee you'll have an effective management program:

1. **Providing administrative commitment and on-going support** "from the top" to assure the success of your program.
2. **Appointing an Energy Conservation Manager (ECM) and developing an energy management team** to coordinate efforts.
3. **Developing clear energy management goals, a step-by-step program structure, and strategies for communicating and implementation.**
4. **Collecting information** on building characteristics, past energy consumption, and energy costs for each building.
5. Using this information to **develop an "energy budget"** which shows how efficient your building is now and indicates how much you can expect to improve this efficiency in the future with appropriate energy conservation techniques.
6. Analyzing the budget and characteristics to **identify potentials for improvement** within each building.
7. **Preparing for a walk-through building audit** by reviewing a list of conservation measures that may be appropriate for your building.
8. **Conducting a walk-through audit** of the building to identify exactly which conservation steps can be implemented and to estimate cost-savings that would result.
9. **Implementing no-cost and low-cost measures** that are obviously cost-effective.
10. **Evaluating potential capital investment measures** identified during the walk-through audit, and considering a professional analysis of the building to determine future savings not identified during the walk-through.
11. **Developing a monitoring system** to determine how much you are actually saving, and where problems exist in the program.

The first five of these steps are discussed in the remainder of this booklet; the others are covered in the audit and capital investment booklets of this series.

The Results You Can Expect

An effective energy management program can achieve these results:

1. First and foremost, **near-term reduction in fuel and utility expenses** through a reduction in energy use by eliminating waste.
2. **Future "cost-avoidance" because reduced energy consumption levels continue year after year.**
3. **Increased awareness of all concerned** that energy use can be reduced without personal hardship or reduced comfort levels; this should stimulate similar efforts in everyone's private life.

Agawam Saves

The school department in Agawam reduced fuel use by over 50% between 1970 and 1976. Despite the dramatic increase in oil prices during that period, the school system's total oil bill for 1976 was $10,000 *lower* than in 1970, and all the costs for modifying the energy system during those 6 years have already been repaid in fuel cost savings.

How Much Can Be Saved?

Here are some ranges of potential savings that you might use as rough rules of thumb. They are based on the assumption that you have relatively inefficient existing equipment and operating patterns, and that you haven't yet started your energy management program.

What You Might Save

	Approximate Range of Potential Savings
Lighting	25 - 40 %
Heating	25 - 40 %
Air Conditioning/ Ventilating	30 - 50 %
Hot Water	10 - 20 %

These savings can amount to substantial amounts of money *every year.* Typical (but not necessarily minimum/maximum) ranges might look like this:

	If Your Annual Bill is:	Range for Possible Savings
Lighting	$6,000	$1,500-2,400
Heating	16,000	4,000-6,400
Air Cond./Vent.	4,000	1,200-2,000
Hot Water	2,000	200-400
Total	**$28,000**	**$6,900-11,200**

Getting Your Program Going: The First Five Steps

Get Commitment—From the Top

Launching a successful attack on soaring energy costs requires a well-organized energy management program. Regardless of the size of your organization, the chief executive or administrator must initiate and give full support to the basic objective of having an effective, on-going program.

This commitment means not only moral support but also active involvement: attending key meetings, designating and working with an energy conservation manager and team, and allocating additional staff time and resources that may be required. It means providing or actively seeking the financial resources that may be needed for capital improvements such as new lights or HVAC equipment. And it means helping to answer any questions that may arise with staff or other users of the building in relation to needed changes in thermostat settings, lighting levels, or other energy-related conditions.

In addition to the active support of the chief executive or administrator, any policy-making board or similar body should also make a commitment to the program. Initial support of this nature is especially important if the program is to be successful in carrying out projects which require substantial financial resources.

Support for an energy management program should be relatively easy to get. There are good chances for success, substantial amounts of money to be saved, and virtually no delicate personnel matters to deal with (as contrasted with cost-cutting programs that require employee layoffs).

Designate an ECM (Energy Conservation Manager)

Ideally, you'll want to have an energy management team or committee with representation from all groups. One person should be designated as the Energy Conservation Manager (ECM), with prime responsibility for working with other members of the team and seeing to it that a successful energy management program is carried out. You'll want to think carefully about your choices for the energy management team and ECM for your particular type of organization and buildings.

Assemble Your Energy Management Team

Four groups of people are essential to the success of your energy management program:

- building maintenance and technical (e.g., engineering) staff—those who maintain the building and are responsible for the control and operation of basic systems such as heating and air conditioning;
- administrative personnel—those who determine the ways in which the building is used and what the staff does;
- financial people—those responsible for decisions on maintenance expenditures and capital improvements.
- building users—those who use the building on a daily basis, turn lights on and off, open and close windows, etc.

Set Goals and Objectives

An energy management program means a thoughtful and practical approach to efficient use of the energy you need. You'll want to have well balanced goals and objectives that reflect the fact that your building is valuable and is an environment for people—for instance, you'll be interested in using less energy so your fuel bills won't soar, but using enough so your building remains comfortable and safe and continues to function properly.

As the first part of your program, your energy management team should develop specific goals to review with the chief executive and perhaps others. However they're stated, the goals probably will include these three dimensions:

- **changing your energy use pattern or standards**, for instance by becoming accustomed to different thermostat settings or using lower wattage light bulbs;
- **making sure the energy is used as efficiently as possible**, for instance, by fine tuning your equipment or switching to more efficient new equipment (such as a new oil burner or more efficient new fluorescent lamps);
- **if practical, changing to more efficient energy sources** (e.g., from electric heat to gas or oil), including alternative energy sources such as solar.

You may choose to state your goals in terms of time and energy saved: for example, "reduce heating fuel use by 20% by next November." It's *theoretically* possible to design and construct *new* buildings which are 90% more energy efficient than most existing ones; as mentioned earlier, 30% is a reasonable overall energy conservation goal for your existing building.

Goals should be stated in writing, and made available to those who will be involved in the program.

Define an Action Program

Effective energy management requires an action program with a logical sequence of steps, deadlines and specific responsibilities for carrying out those steps, as well as the necessary resources (people, time, money). Your program should be written down in the degree of detail necessary for your particular staff and operating methods.

Any action plan consists of five basic steps—inventory, analysis, conclusions and recommendations, corrective action, and monitoring. Here is an example of how your energy action program might be organized on paper:

Example — First Steps in Energy Action Program

Week	Task	Responsibility
1	a) Collect Data on Building Size and Characteristics	ECM (Energy Conservation Manager)
	b) Collect Data on Energy Use and Costs Analyze Data and Costs	ECM business staff
2	Analyze Data and Determine Potential Improvements in Building Energy Efficiency	ECM
3	Plan and Conduct First Building Audits	ECM, administrative person, engineering & maintenance staff
4	Review, Determine Need for Help in Analyzing Complex Systems	ECM, engineering staff

The program should be defined by the ECM (Energy Conservation Manager) with the concurrence of the chief administrator or executive and with input from others on the energy management team. It is most important that the program be **complete, thorough**, and **practical**—that is, a reasonable program that can be carried out successfully in the context of your particular organization and buildings—and at the same time have a set of deadlines which will create momentum to assure you of early results.

The Job of the ECM

The Energy Conservation Manager is responsible for planning, organizing, and administering your energy program. Whoever is designated as the ECM should have a basic understanding of how your building uses energy, be able to develop a logical program for energy management, and be able to enlist the cooperation of others in carrying out the program.

What Your ECM Will Do

Specifically, your ECM should be able to:

- Suggest basic energy management goals, help the administrator set up an energy management team, outline an energy management program, and work out program details with the team.
- Meet with user groups and others to explain the program.
- Obtain information about building characteristics and past and present energy use and costs.
- Use this information to develop an "energy budget" which indicates a potential range of improvement in the energy efficiency of each building.
- Organize building audits, including enlisting expert help.
- Analyze audit results and translate them into specific, recommended operational and capital investment measures, with technical assistance if needed.
- List specific applicable building operation procedures that would conserve energy; determine if these steps can be taken by present maintenance and technical staff or if additional training our outside assistance are needed.
- List potential capital investments, and if possible, estimates for costs, paybacks and financing methods.
- Help the administrator and the team reach agreement on which energy conservation measures to implement; help present capital projects to those responsible for making capital outlay decisions; work out further details, such as contacts with heating contractors capable of doing the work.
- Communicate the specifics of the agreed-upon energy conservation measures to those responsible for carrying them out (e.g., let the engineering staff know the hours when ventilating equipment is to be in operation).
- Monitor energy consumption and progress in carrying out the program, and advise the team and the administrator of problems being encountered; keep the administrator and building personnel up to date with current energy consumption data.
- Let the administrator and others know the positive results the program is achieving.

A Note About "Style"

In general, your ECM's "style" should be as personal and informal as possible—a minimum of memos and conferences—as long as everyone recognizes the ECM's authority and understands what is needed to carry out the program. The ECM must be enthusiastic as well as competent, constantly "selling" the program.

Who Should Be Your ECM?

Probably someone already on your staff—someone interested in energy conservation and familiar with your building and how it's used.

Remember that the ECM is basically a manager and coordinator rather than a technical person. Although some technical understanding is desirable, perhaps the prime qualities an ECM should have are organizational and "people" skills: the ability to develop and articulate a logical sequence of activities and tactfully yet forcefully get people to cooperate in getting the job done.

There may not be a single obvious choice to be your ECM, but you should consider someone on your administrative staff, if possible someone who already has building management responsibility. If you're going to hire someone specifically for the job—and energy cost savings can frequently justify adding someone to your payroll just to carry out the energy management function—remember the things listed above that the ECM will be expected to do. You might want to use that list as the basis of an ECM job description.

What the Energy Management Team Does

The primary job of the team is to help make sure the energy management program is appropriate for your building. The team participates in activities such as meetings and walk-throughs of the building, as needed. The team helps "spread the word" that there's a serious conservation program going on, broadens the understanding of the ECM about particular problems and potentials, and makes sure the needs of the building users are taken into account, particularly with respect to comfort, convenience, safety and health impacts.

Understanding Your Building and How It Uses Energy

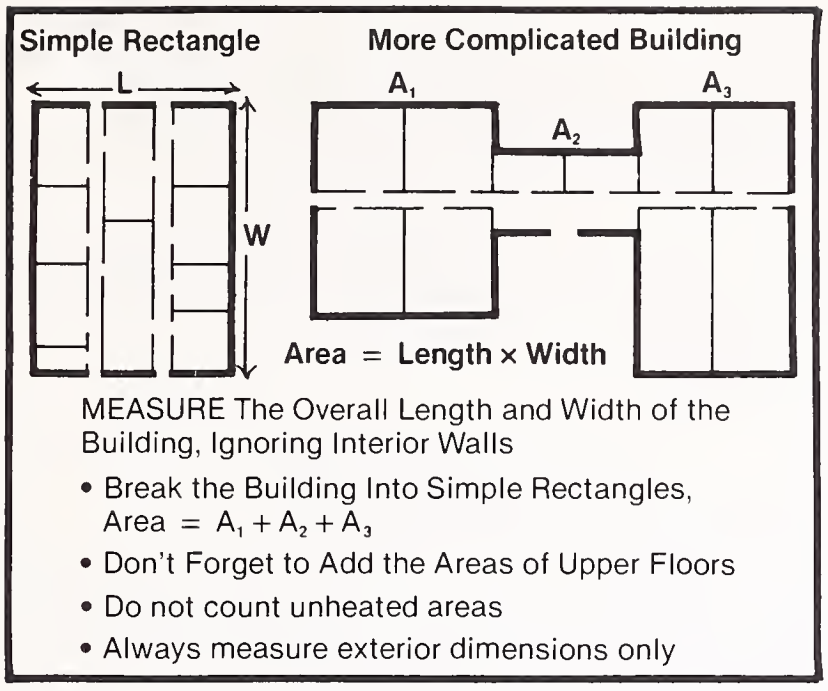
Your energy management program requires some "base line" information—the starting point for understanding where things stand and what can be done to cut energy consumption. The information you need includes the characteristics of your building and the amount of fuel and electricity it consumes.

Building Characteristics

You should use building plans and first-hand measurements and observations to determine:

- **Building Age and General Condition:** including the types of windows, roofing and wall material, and the approximate percentage of glass to wall space.
- **The total heated and cooled interior area of the building,** measured in gross square feet—do not include unheated basement or attic spaces.

How to Measure the Area of Your Building



• **The average daily number of occupants** for normal operating days, and for week-ends and special holidays.
• **The number of hours each day your building is used:** weekdays, weekends, and special holidays. Don't forget evening hours.
• **Brief descriptions and the locations of:**
  · primary heating systems
  · cooling systems
  · ventilation systems
  · lighting systems
  · domestic hot water systems
• **Brief descriptions of any special systems** and energy using areas such as laundries, kitchens, elevators, machine and electric shops, greenhouses, swimming and locker areas, etc.

For each building you're concerned with, this information will give you a building profile that will help you spot some potential areas of energy waste.

Energy Consumption Data

Using a July-June "energy use year", you'll need to record the total quantities of electricity, oil and/or gas consumed annually, as well as their costs. You should use forms like the one shown below. Figures can be obtained either by collecting and totaling monthly fuel receipts and utility bills or asking the fuel dealer and utility company to give you the figures. While more laborious, the compiling method may be more accurate and will give you insight into seasonal patterns.

Energy Use and Costs for One Year

You should develop these records for at least the last three years and average them to cancel out any variations in climate that may have occurred. However, be sure to note differences in building use (e.g., a wing opened or closed) or changes in operation (e.g., thermostat settings reduced 3 degrees last year).

Keeping these records is a fundamental part of your energy management program. These are the bench marks against which to measure your progress. Remember that your objective is to reduce energy *use*. Depending on how much the price of each unit of energy increases, you may or may not be able to reduce your total energy costs. But you should be able to cut the *amount* your building consumes, and these consumption records will show you how well your efforts are succeeding, month by month.

The Energy Budget: How Well is Your Building Doing?

Once you know how much energy your building is consuming each year, it would be helpful to you to have some standard against which to measure your building's performance. If, for example, you found that most buildings like yours use less energy than yours does, you could immediately conclude that there's potential for conserving energy. If you have more than one building you're responsible for, you could compare effi-

Fuel Consumption and Cost Data

USE ONE FORM FOR EACH BUILDING — BUILDING NAME KENNEDY — I.D. ____ E

Fuel code: E (electricity) Fuel code: N (natural gas) Fuel code: D (distillate oil #2) Fuel code: ____

FY 1978	quantity (KWH)	cost	quantity (CCF)	cost	quantity (gals)	cost	quantity	cost
July	29435	1344	2131	722	0	0		
August	30781	1436	1826	630	0	0		
Sept	31470	1277	2066	712	345	149		
Oct	30876	1402	5688	1906	420	182		
Nov	33386	1520	6515	2077	515	223		
Dec	39220	1892	11149	3554	1857	812		
Jan	35616	1699	12880	4193	1480	649		
Feb	34886	1498	12898	4238	1469	644		
March	35808	1615	10239	3365	1341	587		
April	33402	1526	9007	2453	835	363		
May	32078	1461	4790	1305	345	150		
June	32920	1501	2031	634	0	0		
TOTAL '78	399878	18121	81220	25789	8607	3759		

ciencies and "target" the worst ones for your first walk-through audits and conservation efforts. This analysis will give you an "energy budget" of present efficiency and potential savings to use as a guide in your conservation program. The following paragraphs will show you how to develop your energy budget.

Energy Consumption, Costs, and the AEI

Since increasing energy efficiency is a major route to controlling your energy costs, you'll need to have as accurate a measure of the energy efficiency of your building as you can get. The "AEI", or Annual Efficiency Index, is a number which measures the energy efficiency for your building, similar to miles per gallon for an automobile.

The AEI takes into account the different types of energy used by the building for one year and is calculated in units of energy (MBTUs, or thousands of British Thermal Units) per square foot. The AEI for your building might be somewhere between 100 and 200. Note that while an efficient automobile has a *high* number of miles per gallon, an efficient building has a *low* number of MBTUs per square foot.

Measuring the *energy* actually consumed, rather than its total dollar *cost*, to analyze your building's efficiency is important for this reason: the value of a unit of energy remains constant even while the price of that unit (e.g., a gallon of heating oil) increases over time. While you cannot control factors affecting price (such as inflation, and government policies) you *can* control factors affecting consumption. These include: peoples' habits in the building; the efficiency of the building's equipment; and the tightness of the building's outer surface or "shell". The AEI reflects these factors and also the effect of weather. Because the weather factor is not within your control, you will want to adjust your AEIs for climatic differences from year to year and from region to region.

The AEIs you calculate from year to year can be used to show how the energy efficiency of your building is changing. But you may also be able to measure your AEI against a "standard AEI" developed for buildings similar to yours.

Standard AEIs

Building Type	Standard AEI* (MBTUs/Sq.Ft.)	Climatic Adjustment Factor For Your Area*	Local Standard AEI (MBTUs/Sq.Ft.)
Schools Built Before 1945	105	× _____ =	_____
Schools Built After 1945	120	× _____ =	_____
Fire Stations	135	× _____ =	_____
Town Halls (Offices)	115	× _____ =	_____
Libraries	110	× _____ =	_____
Police Stations	105	× _____ =	_____
DPW Garages	105	× _____ =	_____

**Standards are based upon an annual heating season of 5621 Degree Days (Boston's 30 Year Normal). For more information on climate adjustment, etc., please contact the Energy Office (see p.1).*

These "standard AEIs" are averages based on the actual consumption data from analyses of well-maintained buildings in the field. One word of caution, however: remember that this "standard" is really an *average* and does *not* represent an ideal of energy efficiency; it is simply a yardstick. Your energy program should aim at doing even better, *not* just matching this average.

For certain kinds of buildings there are "standard AEIs" available; as more consumption data become available, these AEIs are improved, and new AEIs for additional building types (e.g., hospitals, public care facilities) are being developed.

A Note About All-Electric Buildings

The standard AEIs that have been developed are for buildings that use fossil fuel (oil or gas) for heating and should not be applied to all-electric buildings. All electric buildings will generally have inflated AEIs when compared directly to fossil fuel heated buildings. This does not necessarily indicate that an all-electric building is inefficient, but rather that electricity as an energy source has built-in inefficiencies due to the large energy losses involved in its generation at the utility plant and its transmission to your building.

Building Energy Performance Standards (BEPS)

Some approximate standards for *newly constructed buildings* are being studied in the federal government program for *Building Energy-Performance Standards* (BEPS). These standards are actually AEIs for new buildings, and will probably be much lower than your own AEIs. You may, however, find the comparison to be a useful tool for goal-setting. BEPS standards for most building types can be obtained from the Energy Office (see p. 1).

How to Calculate Your Own AEI

To develop an AEI for your own building you'll first have to convert units of energy into MBTUs using this conversion table:

How to Convert to MBTUs

Energy Source	Unit of Measure	Multiply Units of Measure by this Factor to get MBTUs
Electricity	Kilowatt Hour (KWH)	11.6
Distillate Oil (#2, #4)	Gallon	138.7
Residual Oil (#5, #6)	Gallon	149.7
Coal	Ton	24.5
Purchased Steam	Lb. (pound)	1.39
Propane	Gallon	95.5
Natural Gas	CCF (hundred cubic feet), or "therm"	103.0

For example: 1,000 gallons #2 oil = 138,700 MBTUs

Then you'll want to follow these 11 steps to calculate your AEI:

The 11 Steps for Calculating an AEI
(Annual Efficiency Index)

1. FILL in the total quantities of fuel used annually in the appropriate blanks on lines 2-8.
2. **Electricity:** MULTIPLY the total KWH consumed times the conversion factor:

   _____ × 11.6 = _____MBTUs
   total KWH
3. **Distillate Oil (#2, #4):** MULTIPLY the total gallons consumed times the conversion factor:

   _____ × 138.7 = _____MBTUs
   total gallons
4. **Residual Oil (#5, #6):** MULTIPLY the total gallons consumed times the conversion factor:

   _____ × 149.7 = _____MBTUs
   total gallons
5. **Coal:** MULTIPLY the total tons consumed times the conversion factor:

   _____ × 24,500 = _____MBTUs
   total tons
6. **Purchased Steam:** MULTIPLY the total pounds consumed times the conversion factor:

   _____ × 1.39 = _____MBTUs
   total pounds
7. **Propane:** MULTIPLY the total gallons consumed times the conversion factor:

   _____ × 95.5 = _____MBTUs
   total gallons
8. **Natural Gas:** MULTIPLY the total CCF consumed times the conversion factor:

   _____ × 103 = _____MBTUs
   total CCF or therms
9. ADD up these MBTU's to get the total annual energy consumption for the building:

   Total Energy: _____MBTUs
10. ENTER the total heated area of the building here:

    AREA: _____SQ. FT.
11. DIVIDE the total energy (Line 9) by the Area (line 10) to get the building AEI:

    AEI: _____MBTU'S/SQ. FT.

Comparing Your Building to the Standard

Once you know the standard AEI for your type of building, and the AEI for your own building, you can calculate your own building's energy efficiency, or potential annual savings in energy use, by the following procedure.

The potential annual savings figure could be considered a *minimum* since energy costs keep going up. Also, even though the AEI of your building compares favorably with the "standard" AEI, remember that this "standard" is only an average of how other buildings are performing. Your building still has potential for improvement and significant energy savings.

Figuring Out Potential Savings

1. On line 2, ENTER *actual AEI* from your "11 Steps" calculation and *local standard AEI* from the previous table.
2. COMPUTE the energy savings factor.

   (_____ – _____) ÷ _____ = _____
   (Actual AEI minus Standard AEI) divided by Actual AEI = Energy Savings Factor
3. On line 4, ENTER the total annual energy cost for last year.
4. COMPUTE the potential annual savings.
   ($_____) × (_____) = $_____
   (Annual Energy Cost) × (Energy-Savings Factor) = Potential Annual Savings

Determining What Can Be Done

Your energy management options will include lots of things you *could* do, from turning down the thermostat to installing a whole new heating system. It's relatively easy to decide, from a walk-through audit, on the "low cost" or "no cost" measures which involve little or no capital outlay; making decisions is related mostly to how easily and quickly something can be done, and how much inconvenience is caused, balanced against the amount of energy savings that can be achieved. Capital projects usually will be done in relation to payback periods—the ones that most quickly pay back their cost in energy savings are the ones that will be done first, assuming the basic financing can be arranged. The other booklets in this set will help you make decisions on both kinds of projects.

Start With A "No Pain" Project

Whatever energy conservation steps you decide to take, do *something* as quickly as you can; the longer you wait, the more it costs. Choose something that works and causes little if any inconvenience. A good choice might be installing some energy-efficient fluorescent lamps, removing some lamps where they're clearly not needed, or turning off ventilating systems in unoccupied hours or areas. Then, when you've calculated the savings, let the people in the building know the good results.

Regulations To Be Aware Of

Energy management techniques can be used to reduce energy consumption substantially, but there are certain legal minimum standards which you'll still have to observe. For instance, you can cut your heating bills by reducing the ventilation rate which introduces cold fresh air from the outside during the winter, but the State Building Code may require that you have a minimum cubic feet/minute ventilation rate when your building is occupied. Listed below are the codes which you should be familiar with; you'll find some of them covered in greater detail in the other booklets in this series, but you should be sure you have access to copies and that you check your energy management plans with your local building inspector.

Federal and Massachusetts Regulations

		Applicable to: Schools	Hospitals	Local Gov't. Buildings	Public Care Facilities
HVAC	• Minimum Requirements of Construction and Equipment for Hospitals and Medical Facilities HEW Publication No. 79-14500		●		
	• Nat'l Fire Protection Assoc.: Life Safety Code		●		●
	• State Building Code, article 5	●	●	●	●
	article 22	●	●	●	●
Hot water	• State Plumbing Code, section 14	●	●	●	●
	• State Building code, article 22	●	●	●	●
Lighting	• State Building code, article 22 "Lighting Code"	●	●	●	●
General	• NFPA Life Safety Code		●		●
	• State Building Code, article 22	●	●	●	●

More Things To Consider

Ask The People Who Use Your Building

The people who use your building may be an especially valuable source of ideas for conserving energy. Early in your program you may want to get them together and ask for suggestions. A group session of this kind can get people thinking and contributing new ideas or ones they've had in the back of their minds for a long time.

You may also want to consider using a reward system. One hospital in Pennsylvania offered its personnel a free lunch in the hospital cafeteria for every useful energy saving idea and got lots of responses.

Is Your School System Shutting Down Schools?

If your school system is among those with a declining student population, you may want to look at energy management factors when considering which school to close. Some schools are much more energy efficient than others and will therefore cost less to operate.

Underutilization of your school buildings is expensive in terms of energy, because the energy systems are designed to provide comfort levels for a fully utilized building. The more students there are using a building, the less the per-pupil energy costs of the building will be. Also, a school that is used to capacity will save on its heating bill because of the body heat generated by the students.

References You May Find Useful

1. *Energy Management in Municipal Buildings,* 1976. Massachusetts Office of Energy Resources, 73 Tremont St., Boston, Massachusetts 02108.
2. *Total Energy Management*. Department of Health, Education and Welfare (HEW), Public Health Service, Health Resources Administration, 5600 Fishers Lane, Rm. 10A-41, Rockville, Md. 20857.
3. *Guidelines for Saving Energy in Existing Buildings: Building Owners and Operators Manual.* (ECM-1) National Technical Information Service, 5285 Port Royal Rd., Springfield, Va. 22161.

Deciding What To Do Next

You may have an energy management program well under way, or you may just be getting one started. In either case, you'll want to decide on appropriate next steps to take. As the costs of energy, equipment, and labor continue to rise, you should make every effort to avoid delays in carrying out an effective program.

You may find the following checklist helpful in deciding what to do:

We should:

__Decide to have an Energy Management Program

__Designate an Energy Conservation Manager and Team

__Develop a Program Action Plan

__Obtain other Publications or Training

__Prepare an Energy Budget

__Purchase Audit Tools

__Conduct Walk-Through Audits

__Identify Outside Energy Experts

__Appropriate Funds for Needed Expertise and Capital Improvements

__Other_____

Names of Possible Managers:_____

Date for Completing Action Plan:_____

Date for Collecting Data and Preparing Energy Budget:_____

Likely First Target (Buildings or Projects):_____

_____

Date for Next Meeting:_____

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